

### Trend Study 17-61-02

Study site name: American Fork Canyon.

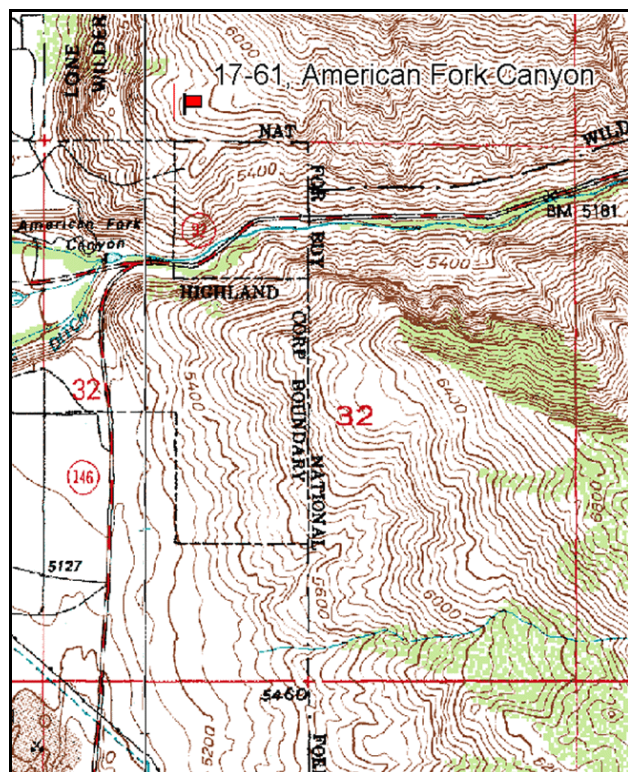
Vegetation type: P-J and Big Sagebrush.

Compass bearing: frequency baseline 330 degrees magnetic.

Frequency belt placement: line 1 (11 & 95 ft), line 2 (34 ft), line 3 (71 ft), line 4 (59 ft). Rebar: belt 2 on 1 ft.

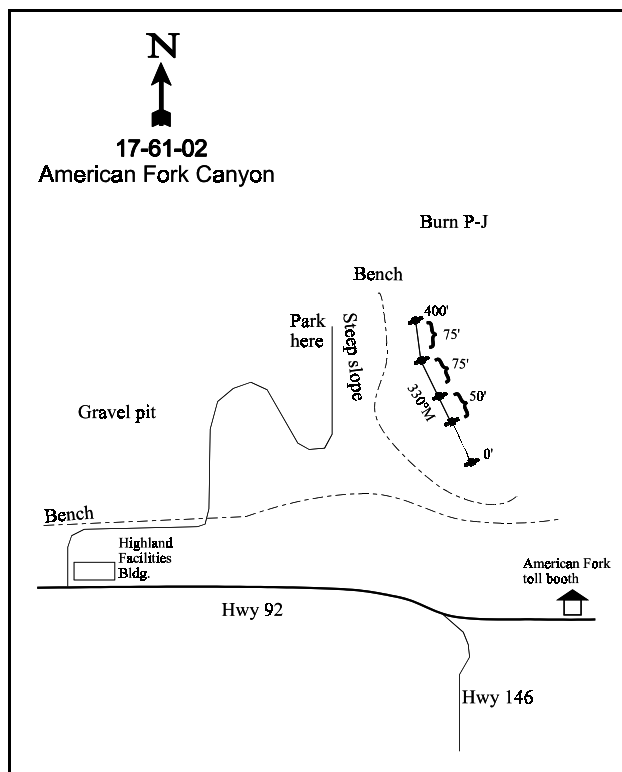
### LOCATION DESCRIPTION

Go to American Fork Canyon on Highway 92. Toward the mouth of the canyon, there is a gravel pit on the north side of the road along with Highland Facilities building. Turn left on the road going north just before the buildings. Continue up this road until a steep slope is encountered. The site lies on the first bench of this slope. Park here. Walk east up the steep slope about 1/4 of a mile to another bench that has been burned. The site is just south of the burn. GPS coordinates will be helpful on this site. Development is currently under construction and this route may not be available in the future.



Map Name: Lehi

Township 4S, Range 2E, Section 29



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4476253 N 436513 E

## DISCUSSION

### American Fork Canyon - Trend Study No. 17- 61

This trend study was established in 2002 at the mouth of American Fork Canyon to monitor important winter range for an increasing population of Rocky Mountain bighorn sheep which were transplanted in the late 1990's. The study samples a sagebrush-cliffrose community with an overstory of Utah juniper. Slope is 20% with a west aspect and an elevation of 5,700 feet. The area receives some winter use by deer and elk, but bighorn sheep use the area heavily. A pellet group transect read on the site in 2002 estimated 29 deer and 17 elk days use/acre (72 ddu/ha and 42 edu/ha). Bighorn sheep use was estimated at 56 sheep days use/acre (137 sdu/ha). Most of the big game pellet groups appear to be from winter use.

Soil at the site is shallow and extremely rocky. Parent material is limestone which is exposed in large bed rock outcrops. The surface contains abundant large and small limestone gravel. The rocky soil made digging soil samples and probing for effective rooting depth difficult. As a result, effective rooting depth measurements averaged only about 10 inches. Deeper rooted shrubs, mountain big sagebrush and cliffrose, are obviously rooting through cracks in the rock. Soil texture is a loam with a slightly alkaline reaction (pH 7.4). Soil temperature is relatively high averaging 73° F at 13 inches in depth. There is little exposed bare ground and the erosion condition class was determined as stable in 2002.

The site is dominated by juniper with an understory of mountain big sagebrush, true mountain mahogany, and cliffrose. Juniper overstory accounts for over two-thirds of the total browse cover. Point quarter data from 2002 estimated a density of 41 trees/acre with an average diameter of 9 inches. About one-half of the trees sampled were highlined. Total juniper canopy cover is variable but averaged nearly 15%.

The key browse species is mountain big sagebrush which accounted for 89% of the understory shrub cover. Density was estimated at 1,500 plants/acre in 2002. The population is mostly mature with decadent plants accounting for 25% of the population. Utilization is light to moderate with about 20% of the population displaying heavy hedging. Vigor of mature plants is good, but 68% of the decadent plants sampled were classified as dying (>50% crown death).

Other preferred shrubs sampled include a few moderate to heavily hedged true mountain mahogany and cliffrose. Mahogany is estimated at only 40 plants/acre, while cliffrose numbered 80 plants/acre. Less palatable shrubs sampled include a few white rubber rabbitbrush, broom snakeweed, and pricklypear cactus.

The herbaceous understory is poor and totally dominated by a thick stand of cheatgrass. It accounts for nearly 100% of the grass cover or 97% of the total herbaceous cover. Only a few perennial grasses were encountered on the site. Forbs are rare and contain mostly weedy annuals. This site is in danger of burning which would totally eliminate all of the winter browse forage. A fire did burn just to the north of the study site a few years ago.

### 2002 APPARENT TREND ASSESSMENT

The soil is shallow, rocky, and adequately protected from erosion. Protective ground cover is abundant and the erosion condition class was determined to be stable. The sagebrush population appears to be feeling the effects of drought combined with competition with juniper and cheatgrass. Vigor is normal on mature plants, but 68% of the decadent plants sampled appear to be dying. Recruitment is marginal and not currently adequate to prevent a future decline in density. A return to normal precipitation patterns would do much to improve the sagebrush population. The herbaceous understory is very poor and totally dominated by cheatgrass. It accounts for nearly all of the grass cover and 97% of the total herbaceous cover with a high cover value of 41%. Perennial forbs are nearly absent. The abundance of cheatgrass puts this site in danger of burning.

HERBACEOUS TRENDS --  
Herd unit 17 , Study no: 61

T y p e	Species	Nested Frequency  '02	Quadrat Frequency  '02	Average Cover %  '02
G	Agropyron spicatum	2	1	.03
G	Bromus japonicus (a)	3	1	.00
G	Bromus tectorum (a)	425	95	41.21
G	Poa bulbosa	6	3	.01
G	Poa secunda	1	1	.00
Total for Annual Grasses		428	96	41.22
Total for Perennial Grasses		9	5	0.04
Total for Grasses		437	101	41.27
F	Alyssum alyssoides (a)	63	21	.18
F	Descurainia pinnata (a)	4	2	.01
F	Draba spp. (a)	4	2	.01
F	Erodium cicutarium (a)	30	10	.56
F	Heterotheca villosa	1	1	.00
F	Holosteum umbellatum (a)	3	3	.01
F	Ranunculus testiculatus (a)	5	3	.19
F	Salsola iberica (a)	1	1	.00
F	Sisymbrium altissimum (a)	5	3	.24
Total for Annual Forbs		115	45	1.21
Total for Perennial Forbs		1	1	0.00
Total for Forbs		116	46	1.22

BROWSE TRENDS --  
Herd unit 17 , Study no: 61

T y p e	Species	Strip Frequency  '02	Average Cover %  '02
B	Artemisia tridentata vaseyana	40	3.49
B	Chrysothamnus nauseosus albicaulis	1	-
B	Cowania mexicana stansburiana	6	.45
B	Juniperus osteosperma	5	7.80
B	Opuntia spp.	4	-
Total for Browse		56	11.74

CANOPY COVER -- LINE INTERCEPT

Herd unit 17 , Study no: 61

Species	Percent Cover '02
Artemisia tridentata vaseyana	4.33
Cowania mexicana stansburiana	2.58
Juniperus osteosperma	14.83

Key Browse Annual Leader Growth

Herd unit 17 , Study no: 61

Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	3.1
Cowania mexicana stansburiana	3.8

Point-Quarter Tree Data

Herd unit 17, Study no: 61

Species	Trees per Acre '02	Average diameter (in) '02
Juniperus osteosperma	41	9.1

BASIC COVER --

Herd unit 17 , Study no: 61

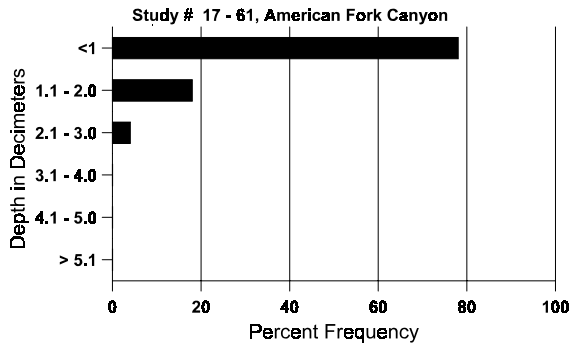
Cover Type	Nested Frequency '02	Average Cover % '02
Vegetation	437	52.60
Rock	320	21.68
Pavement	147	1.52
Litter	464	40.96
Cryptogams	7	.09
Bare Ground	130	4.66

SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 61, American Fork Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.8	73.3 (13.0)	7.4	29.3	46.7	24.0	6.3	105.6	313.6	.9

## Stoniness Index



### PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 61

Type	Quadrat Frequency	Pellet Transect	
		Pellet Groups per Acre	Days Use per Acre (ha)
	'02	'02	'02
Rabbit	18	-	-
Bighorn Sheep	33	722	56 (137)
Elk	7	226	17 (43)
Deer	13	383	29 (73)

### BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 61

A Y G R E	Form Class (No. of Plants)	Vigor Class									Plants Per Acre	Average (inches)		Total				
		1	2	3	4	5	6	7	8	9		1	2		3	4	Ht.	Cr.
Artemisia tridentata vaseyana																		
Y	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	02	40	7	7	-	-	-	-	-	-	54	-	-	-	1080	22	31	54
D	02	2	6	7	-	1	1	2	-	-	6	-	-	13	380			19
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	540			27
% Plants Showing '02		<u>Moderate Use</u> 19%			<u>Heavy Use</u> 20%			<u>Poor Vigor</u> 17%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)											'02	1500	Dec:	25%				
Chrysothamnus nauseosus albicaulis																		
M	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	23	44	0
D	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)											'02	20	Dec:	100%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cowania mexicana stansburiana																		
M	02	-	1	-	-	-	1	-	-	-	2	-	-	-	40	39	43	2
D	02	-	-	1	-	2	1	-	-	-	3	-	-	1	80			4
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
% Plants Showing '02		<u>Moderate Use</u> 50%			<u>Heavy Use</u> 50%			<u>Poor Vigor</u> 17%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	120	Dec:	67%	
Gutierrezia sarothrae																		
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	0	Dec:	-	
Juniperus osteosperma																		
M	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100	-	-	5
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	100	Dec:	-	
Opuntia spp.																		
Y	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60	3	5	3
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	80	Dec:	-	